Matlab for Engineers with Application (ME 1311/01) Course Syllabus

Instructor: Dr. Hessam Mirgolbabaei

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Class time: Monday, 11:00 AM - 12:40 PM and Wednesday, 11:00 AM – 1:50 PM

Prerequisite: MATH 1113 (Pre-Calculus)

Course introduction:

This course provides an introduction to fundamental computing principles and programming concepts. Students use the high-level programming language, MATLAB to develop and implement programs to solve engineering problems. Basic programming concepts covered include: algorithm design, data types, flow control, functions, sorting, plotting, simulation, and numerical methods.

Course grade determination:

Your grade in this course will be determined from your performance on lab assignments, and case study (includes the presentation of your project). The main emphasis of the course is on gaining practical skills. For this reason, the lab sessions are essential and should not be missed.

Lab assignments	50%
Case Study	50%
Total	100%

Lab assignments are from the previous practice labs and other materials taught in class. You need to prepare the list of MATLAB commands and use them during the lab assignments. During the allocated time, you answer the questions by typing appropriate commands.

Information about **case studies** will be given in detail. You will use MATLAB to solve some engineering problems. Besides, students are encouraged to choose the case studies related to a Mechanical Engineering related topics.

This schedule (including the grade distribution and the number of projects) is tentative and may be revised.

Course content- Topic coverage:

- MATLAB environment and commands
- Linear Algebra and matrices
- Fundamental engineering computing
- Save, load, display and fprintf commands
- Communication with Excel
- 2D and 3D plotting
- Solutions to systems of linear equations
- Conditional statements
- Loops
- MATLAB scripts and functions
- Polynomials, including differentiation and integration
- Using Matlab for simple engineering problems

Course Outcomes:

By the end of this course, students will be able to:

- Introduce vectors and matrices in Matlab,
- Apply basic concepts of Linear Algebra for vector and matrix operations,
- Perform 2D and 3D plotting,
- Write conditional statements and loops,
- Write Scripts and functions in Matlab,
- Solve some engineering problems using Matlab,
- Apply the fundamental knowledge of mathematics, science & engineering, to solve the real mechanical engineering problems (through case studies).

Academic Honesty:

SPSU has an Honor Code and a procedure for handling cases when academic misconduct is alleged. All students should be aware of them. Information about the Honor Code and the misconduct procedure may be found at http://scai.kennesaw.edu/codes.php.

Disabilities:

Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the ATTIC counselor working with disabilities at 678-915-7316, now in the Basement of the Student Center, as soon as possible to better ensure that such accommodations are implemented in a timely fashion.